THE JOURNAL

OF THE

NATIONAL ASSOCIATION of CHIROPODISTS

CONTENTS—

	Page
Foot Defects As Possible Etiological Factors in Cancer S. J. Wikler, D.S.C.	19
Wound Healing D. W. Austin, D.S.C.	27
New Methods of Muscular Regeneration For Equilibrium By Electro-Therapy J. M. Horwitz, D.S.C.	31
Hemostasis with Absorbable Material in Operations on the Foot A. Gottlieb, M.D.	36
President's Message L. A. Walsh, D.S.C.	40
1951 N.A.C. Awards Notice	44
Official Announcements	47
American Foot Health Foundation	50
Book Notice	56
Organization News	56
Miscellaneous	60
Convention Dates	71
Deaths Reported	71

THE OFFICIAL PUBLICATION OF THE PROFESSION

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VOL. 40, NO. 8 AUGUST, 1950

HOSPITAL BILLS DOUBLED: 30 NEW PATIENTS A MINUTE

Patients' hospital bills have more than doubled in 10 years; in 1949, 30 patients a minute entered the hospitals.

These figures have just been announced from official sources. The first statement was made at a meeting of the Tri-State Hospital Association in Chicago.

"Before the war, operating charges were $5, $6 and $7 a day per patient." Ralph M. Hueston, superintendent of Wesley Memorial Hospital in Chicago, declared.

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The report, published in the Journal of the American Medical Association, also showed that the United States had 6,572 registered hospitals in 1949 compared with 6,335 the previous year. Bed capacity jumped from 1,423,520 to 1,439,030.

The estimated total of all persons covered by insurance, for hospitalization at the end of 1949 was 68 million, also more than 41 million for surgical care, and more than 17 million for medical care.

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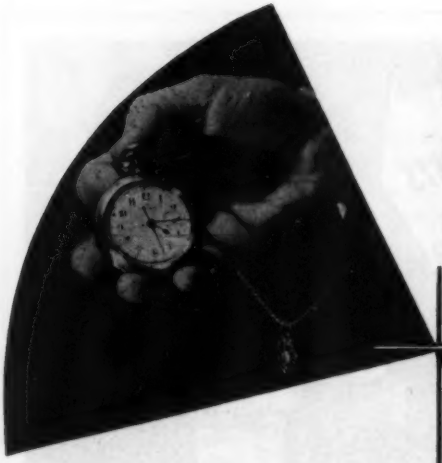

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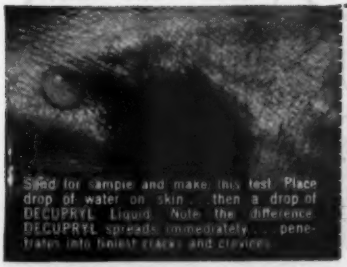

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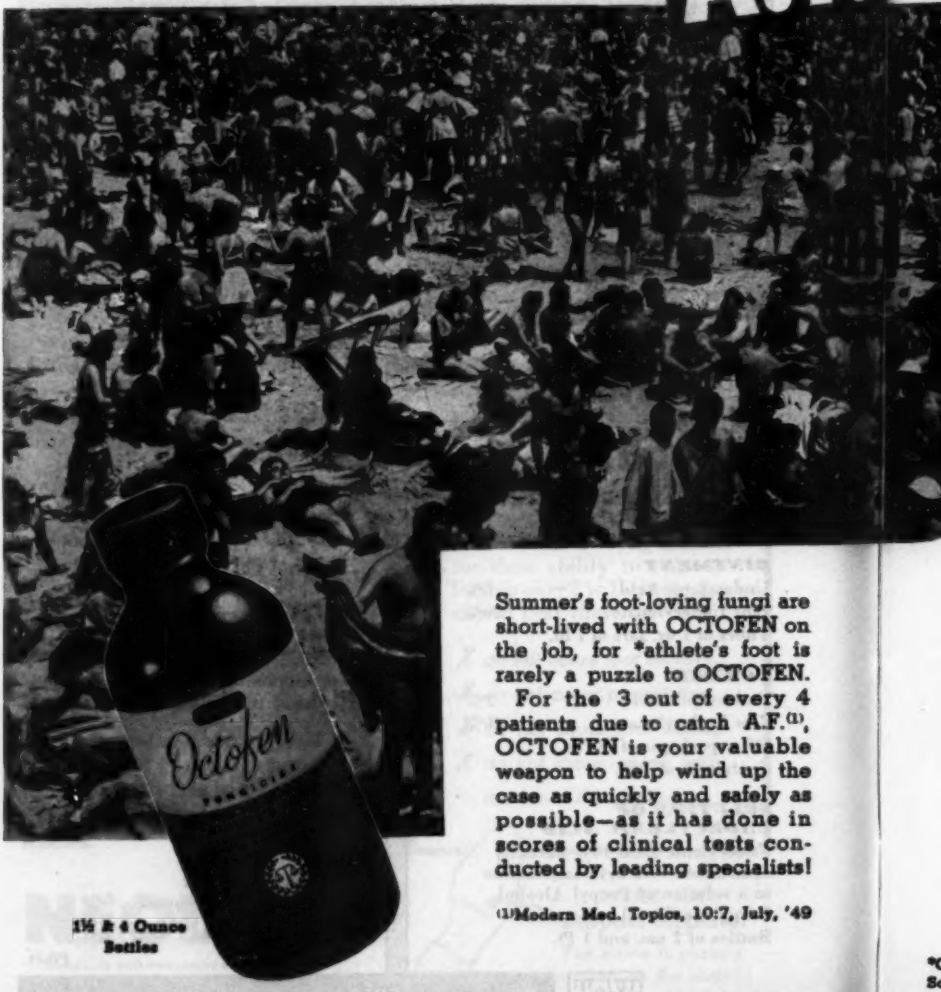

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(1)Modern Med. Topics, 10:7, July, '49

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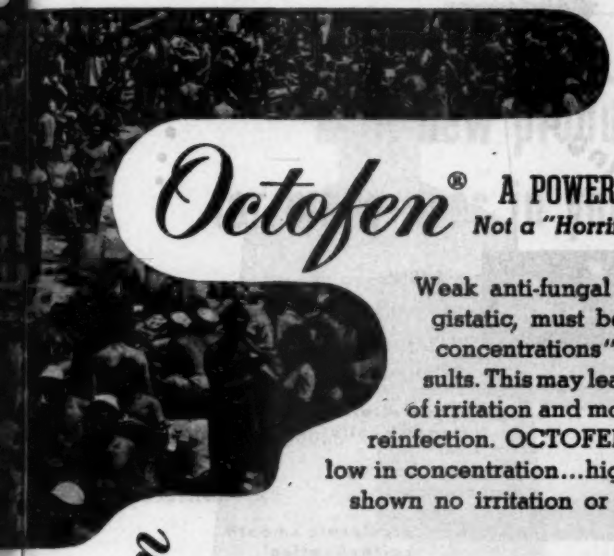

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***Ostaz, E. A. & Golden, M. J.: Alcohol Soluble Fungistatic and Fungicidal Compound, A. J. Pharm, 121:375 (Oct.) 1949**

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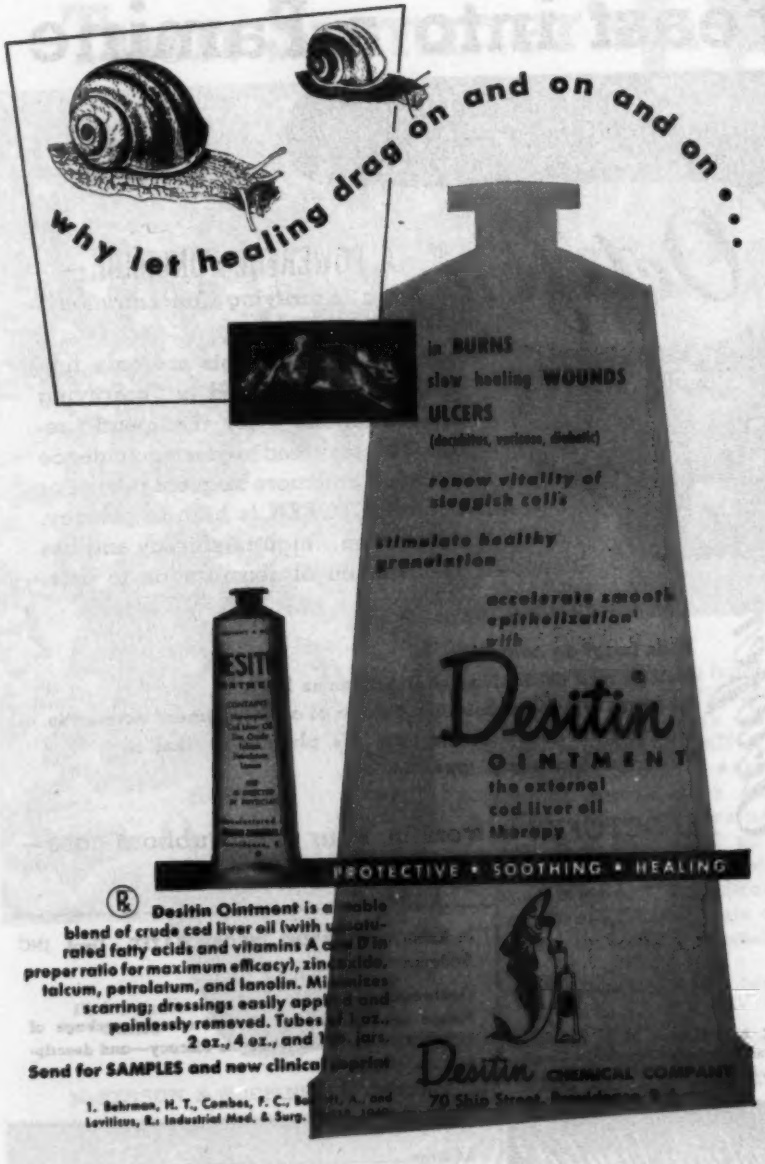
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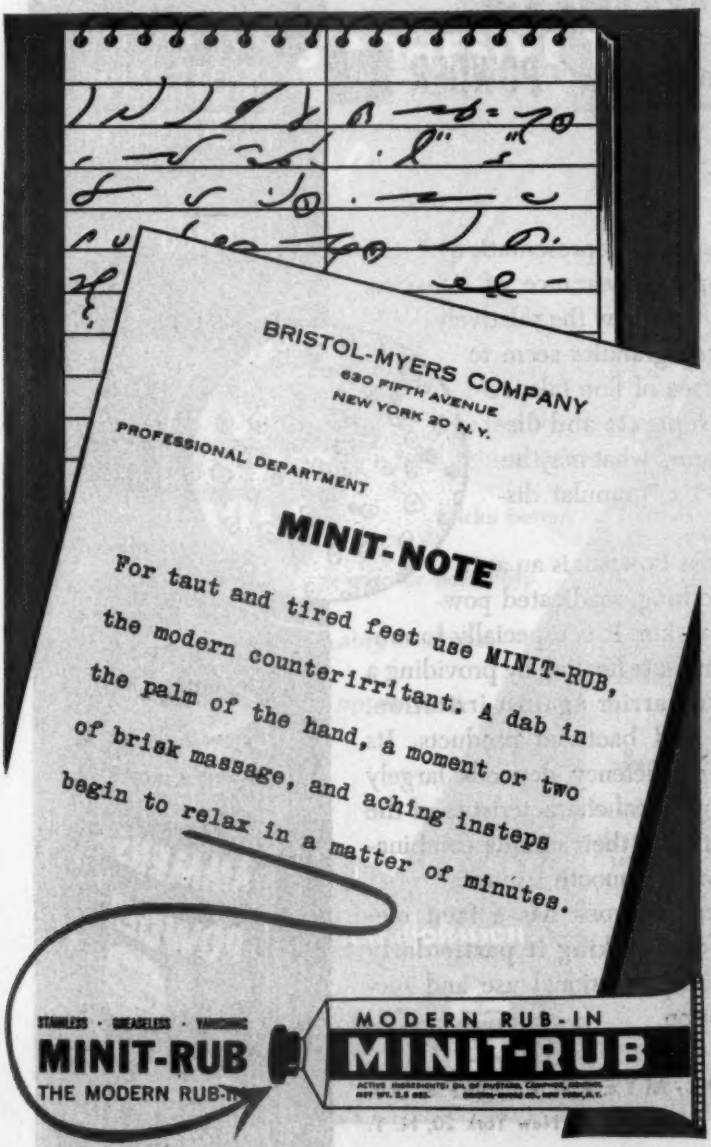
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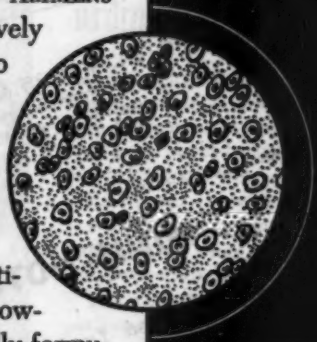

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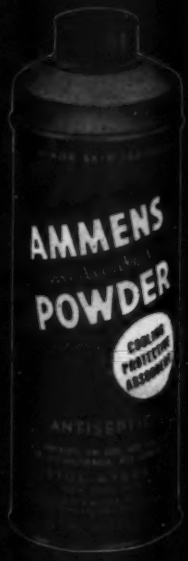

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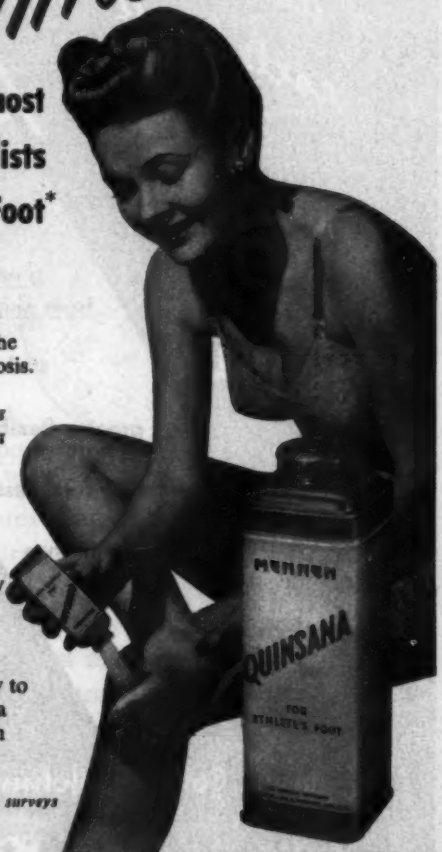

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THE OFFICIAL PUBLICATION OF THE PROFESSION

VOLUME 40 AUGUST, 1950 NUMBER 8

FOOT DEFECTS AS POSSIBLE ETIOLOGICAL FACTORS IN CANCER

S. J. WIKLER, D.S.C.
Baltimore, Md.

WE OF COURSE do not yet know clearly and exactly the cause or causes of cancer, but it is the purpose of this paper to discuss the hypothesis that foot disorders may be causative factors in some cancer, with emphasis on the bodily effects of postural abnormalities deriving from foot defects.

It is postulated that in modern civilized societies the wearing of shoes will set up changes in the feet which do not occur in races which habitually wear no shoes, or only non-deforming sandals. It is further claimed that these foot changes, whether or not they be recognized as definite deformities, may nevertheless either directly or indirectly act as a source of chronic traumata operating at the site of cancer formation.

Introductorily, James Dowie noted as early as 1861 that the normally barefooted street urchins of the London slums had perfectly healthy feet, while their wealthier and shod contemporaries suffered the usual arch and foot disorders. In 1905 P. Hoffman reported[1] the examination of over 600 non-shoe wearing savages, none of whom exhibited the static foot deformities common to civilization. Again, in 1912, Major Munson, who made an intensive study of feet and shoes preparatory to developing the famous Munson Last, stated that non-shoe wearing peoples suffer none of the usual foot diseases encountered in civilization.[2] Dr. Dudley Morton in 1931 made a trip to Africa specifically to investigate further his theory regarding the short first metatarsal bone as an evolutionary factor in modern foot disorders. In his reluctant report[3] Dr. Morton frankly declares that non-shod natives, including those with short first metatarsals, suffered no static foot abnormalities.

More recently Dr. Samuel Shulman reported, in the JOURNAL OF THE NATIONAL ASSOCIATION OF CHIROPODISTS,[4] the results of the examination he made of the feet of 5,126 non-shoe wearing individuals in India and China. Dr. Shulman's percentage tables demonstrate that arch troubles,

bunions, and corns and calluses are scarce to the point of rarity in such groups.

To discuss another angle, we may note that in 1900 cancer caused 3.7% of all deaths in this country, whereas in 1946 the mortality was 13.5%. This great increase (if the postulate of foot deformity as a contributory cause of cancer is accepted) might be explained by citing the deforming character of shoes in the last fifty years, since at the turn of the century pointed toes and French heels became the vogue. Every chiropodist sees many elderly patients whose feet began to show abnormalities forty years ago, when the manufacture and merchandising of high-style shoes became commonplace and widespread, with a great wave of foot deformity resulting therefrom. For example, Dr. R. Whitman[5] reported an increase in his *pes planus* cases from 2.6% in 1890 to 29.2% in 1913. It is interesting to note that the incidence of cancer shows a sharp increase during the same general and later periods. This increase may be attributed partly to the greater longevity of our population, but the percentage increases of cancer is still proportionately greater than would normally be projected.

In 1946 women between the ages of thirty and fifty-nine had a 26.6% death rate by cancer, whereas men suffered a 12.4% mortality rate from this cause. It is unnecessary to point out to chiropodists that women are far more apt to wear deforming shoes than are men, and that therefore the body mechanics of women are more apt to become disordered.

In general, on a world-wide geographic basis, it is possible to show statistically that the incidence of cancer increases as we compare the primitive, non-shoe wearing peoples with those peoples farther advanced in the scale of civilization and therefore more likely to be wearers of deforming footgear. Indeed, a similar greater incidence may be demonstrated within the confines of the United States: in the southern states, where a greater proportion of the population is likely to be barefooted more of the time, the death rate from cancer is about one-third that of the New England area, where practically all of the population wears shoes the year 'round.

Scientists of course will point to other factors than deforming footwear, such as diet, hygiene, climate, etc., as influences on cancer formation. A difference is that in the case of postural disorders arising from foot deformity, a direct traumatic relationship to cancer may reasonably be adduced, where as it is difficult to demonstrate such physiological integration when considering diet and the other named factors.

Anatomical and Mechanical Relations

We know that the normal foot which has not been confined in shoes is much broader across the ball and toes than is the shoe-wearing foot; the former is more than twice as wide as the widest part of its heel, and when the first and fifth toes are abducted from the midline of the foot, this width is even greater, providing a wide anterior base for balancing the superimposed body. In shoe-wearing peoples, on the other hand, it is only in infants that we see a normally wide forefoot, because after a few years of transverse compression by shoes the forefoot shows little or no tendency to spread at the ball as does the habitually shoeless foot. (Fig. 1)

We usually estimate that foot disorders in the United States affect from seventy to eighty percent of the population. In a large proportion of cases, the foot deformities follow closely the pattern of the shoes. (Fig. 2). The toes are rendered puny, deformed and useless. The intrinsic foot musculature which normally controls the toes becomes atrophied to a weak fibrous mass which is noticeably less bulky and strong than the same musculature in a non-shoewearing foot. The phalanges are forced back against the metatarsal bones, which in turn exert backward pressure against the tarsus, with the end effect that the musculo-osteological entity of the foot loses the proper structure, relationship, and strength that is required if the foot is to perform its function correctly. The elevated heels of modern shoes thrust an abnormal proportion of the body weight on weakened structures which even in normal feet are not designed for such stresses. In order that the individual may remain upright, his deformed feet, with their constricted and weakened anterior pier, must call on other areas for help in supporting and balancing the body. The substitution which nature provides is to evert the feet, thus bringing down the elements of the medial side of the foot to serve as an auxiliary supporting pier. (Fig. 3)

Reliance on the inner side of the foot is proportionate to the loss of width and strength through the toes. The painful adjustments of the soft inner structures of the foot are followed by changes which take place throughout every part of the body. In a rigid structure, such extensive changes in the base would cause collapse. In the human being, however, the many skeletal joints move and change accommodatively to permit the body to remain balanced in a more or less upright position.

Foot disorders in adults frequently develop in acute form when the elements of the body cannot accommodate to a new gravitational demand without serious strain and malfunctioning. This strain and malfunctioning may occur simultaneously or *seriatim* in practically every part of the superimposed body. While symptoms will of course be most severe in a sudden change of foot posture, any gradual deformity occasioned by our modern shoe may also make unusual postural and mechanical demands on organs and soft tissues. What we shoe-wearing moderns consider non-painful and minor deformity of the feet may

Fig. 1

Contour of feet found in infants and non-shoe wearing people.

Fig. 2

Contour of feet in shoe wearing people assumes the shape of the foot.

Fig. 3

When balancing area of toes is reduced the medial border of the foot must be used to maintain body balance.

assume grave importance when translated into such compensatory reactions.

Consider osteological changes which poor feet may induce in the rest of the body: The head, neck, thorax, and upper extremities are supported by the spinal column. This in turn is mortised into the bowl-like pelvis. Two buttress-like projections of the femurs support the pelvis, and these buttresses carry the thrust to the long, heavy thigh bones, slanting downwardly and inwardly to the knee, from whence the weight is carried by the leg bones, which in turn are supported by the massive ankle and heel bones. The forefoot with its 22 small bones acts as a balancing agent for the whole weight of the body. When the forefoot is tampered with, gravitational changes will occur throughout the upper structures. With greater deformity of the feet, these secondary changes are also greater.

As described earlier, the strained foot everts to provide a wider base of support, although this eversion may be so slight as to be nearly imperceptible. Weight is disproportionately placed on the under side of the foot in varying degrees, according to the amount of muscular and forefoot damage, the leg twists outward to compensate for changed attitudes in the foot, so that the weight falls more toward the inner side of the knee. The thigh bones correspondingly twist outwardly, which motion in turn reduces the anterior support of the pelvic bowl. The pelvis characteristically dips downward in front and tilts upward in back, resulting in prominence of both abdomen and buttocks.

With the pelvis tipped forward and down, the many-segmented spine must curve a number of times in order to compensate for the pull of the pelvis and belly, and still keep the body weight in a direct gravitational line with the heels. The spine bends forward at the lumbo-sacral articulation, forming a hollow at the small of the back, and juts, in front, into the pelvic and abdominal areas, thus reducing the abdominal space. If one foot is worse and thus assumes less weight, the spine will twist sideways in scoliosis. The spine in the thoracic region curves backward, causing a humped appearance. The chest cage becomes depressed in front, lowering and depressing the anterior chest wall. The spine then bends forward at the neck, so as to maintain the head in a gravitational line with the inner side of the heels and arches of the feet.

In addition to the bones, the softer tissues are also affected by these changes in body mechanics. The weight, instead of being carried primarily on joint surfaces, must now be more extensively supported by ligaments and muscles, causing the latter to suffer strain and fatigue. Bones and joints assume unnatural stress and strain which they cannot readily accommodate. Vital organs throughout the body change their natural relative positions. Blood vessels and nerves are subjected to stretchings and abnormal pressures. Altogether, the refrain which chiropodists hear constantly, "When my feet hurt, I hurt all over," expresses a very profound truth.

As a specific instance of gross postural pathology, we mention the diaphragm, the important muscular band separating the thoracic and abdominal cavities, and attached to the lower rigs. When the rib cage sinks, the diaphragm sags with it, allowing all the abdominal organs which it supports to settle also, so that the abdominal cavity becomes even more shrunken, spatially. Consequently, the lower abdomen bulges an-

teriorly. In the unbalanced foot attitude the otherwise firm musculature of the abdominal wall is no longer strongly function, since the abdomen is forward of the center of gravity. The entire body and its component parts are now out of natural position, and suffering from abnormal relationships, strains and pressures. The increased pressure, by the displaced abdominal organs, on the pelvic vessels supplying the lower extremities causes even greater pathology in the legs and feet.

The preceding summary may indicate that current scientific knowledge of foot disorders and the role they may play in systemic disease is only in a primary stage, since foot disease in the endemic proportions we have today is a comparatively new phenomenon which began with modern high-style shoes. Mechanical sources of disease may of course arise from higher sources of the body, but it may be that in our modern shoe-wearing societies, foot trouble is a major, if unrecognized source of mechanical ills. Certainly many of the idiopathic, non-infective, degenerative diseases are influenced by foot disorders. Since cancer may be called a segment in this plexus of degenerative diseases, perhaps it would be worth while to see if we can relate the occurrence of cancer in any way with our endemic foot pathologies.

Possible Relationships Between Foot Pathologies and Cancer

After preliminary remarks on cancer formation, we will try to correlate some facts on foot disorders (and the systemic postural traumata therefrom) with other facts regarding certain cancers. Until the ultimate cause of cancer is known, research on the formation of cancer cells will be largely speculative, but the hypothesis of cancer cell formation used here is necessary background for presentation of the titular subject of this paper.

The multiplication of cells in the human being is an orderly, regular process, in that the single cell of the fertilized ovum eventually becomes the multi-celled adult. In adult life some cells, such as those of the skin and connective tissue, have the power to divide and multiply, and it is this power which permits the repair and restoration of injured flesh. In cancer the orderly creation of new cells as needed is abandoned; the cancer cells multiply without stint, monopolizing nourishment and blood supply to the detriment of normal tissues, and sending off cells throughout the body which are capable of multiplying rapidly. These cancer cell masses eventually strangle the vital functions of the body, causing death.

Cancer is considered never to originate in normal tissue. Before a cancer growth begins there is a pre-cancerous state, in which there is an interference with the perfection underneath the lining of organ surfaces or coverings. When a disorganization occurs the lymph fluid slows down and becomes laden with irritating chemicals which normally would be rapidly excreted. In place of constantly fresh intercellular fluids bathing healthy cells and tissues, we see a group of cells which in response to the stagnant irritants divide and multiply rapidly. The tissue then becomes aged, not in a chronological sense, but rather from frequent division. A. P. Gould[6] theorizes that anything which wears out a cell by constant irritation and increase of cell generation causes the cell

to become senile and disoriented, and eventually results in the cancer cell.

Thus, cancer in its early stages is not a systemic disease but is a local pathology affecting only a small area of tissue. It is only after metastasis occurs that the disease becomes systemic in nature.

Virchow[7] advanced the theory that chronic irritation, trauma, and inflammation constitute a direct cause of cancer, and this theory has not been disproven. It is the hypothesis of the present author that this theory of chronic irritation and trauma may explain the inception of such common cancers as those of the breast—with the original trauma in many cases deriving from malfunctioning feet! Here, cause and effect are structurally at a distance from each other, but the relationship may nevertheless exist, as this paper attempts to show.

Cancers Discussed by Site

The percentage of all cancers which appear at the respective sites to be discussed is as follows: Breast, 9.6%; Stomach, 14%; Prostate, 7.5%; Uterus, 9.5%[8].

The female breast is slung between a deep and a superficial fascia. Fascial septa called Cooper's ligaments connect these two fascia, and also help to support the organ, in addition to carrying the blood and nerve supply. The compartments thus formed contain the secretory components of the breast. The deep fascia is a strong, tough tissue lying over the pectoral muscles and continuous with the thoracic fascia. The superficial fascia is closely attached to the septa and skin. In the normal posture a considerable portion of the upper breast is supported by the thoracic plane which faces upward and outward. In the typical weakfoot posture, the chest slumps so that this plane becomes more vertical and therefore less supportive, and the pendulous portion of the breast now strains and pulls from this less secure base. Breast cancer is most common during the age (35 to 60 years), when the breasts are most prone to enlarge and sag. With the upper plane of the chest shirking its supportive function, the resultant perpetual strain, and the unnatural situation of lymph and blood vessels make for chronic irritation, inflammation, and lymphatic stasis, all of which constitute a favorable medium for cancer growth.

In considering cancer of the stomach, we recall that in the typical posture of unbalanced feet both the chest and the diaphragm sag unnaturally, and that this action reduces the abdominal cavity. The normal motions of the stomach become more limited, and the ptosis of the organ makes the movement and digestion of food a more difficult process, with some stagnation and consequent irritation. Again we have inflammation, ulceration and even, perhaps, a developing malignancy as sequels.

Not all the pressure of the sagging diaphragm and abdominal organs is dispersed through the anteriorly bulging abdomen; a considerable portion of this pressure is directed backward against the pelvic organs. These organs, lying in a bony bowl, transfer a part of this pressure farther downward against the perineum, squeezing the lower abdominal blood and lymph vessels in the process, and interfering with drainage. Goldthwaite[9] asks, "Is it not possible that here is an explanation of the

congestion of the bladder and prostate so often found in older men, which may lead to prostatic hypertrophy and malignancy?"

According to Cunningham[10], the position occupied by the uterus in the pelvis is not constant. The anterior surface rests against the bladder and follows the rising and falling of that organ as it becomes filled or emptied. If the rectum be emptied and the bladder much distended, the uterus is pushed so far posteriorly that its long axis may correspond to that of the vagina. The cervix, however, is firmly fixed in relation to the vagina. With any abnormal sagging of the abdominal viscera the uterus becomes so crowded and restricted that it can no longer move with ease. The cervix itself thus receives the greatest strain from abnormal torsion. Continuous strain on such a vascular and highly sensitive organ may account for many of the diseases which affect the cervix, including cancer.

Conclusion

There are other organs which present a high incidence of cancer. These include the rectum, intestines, liver, and brain. It is felt, on reasoning similar to that which has just been presented, that these organs, too, may be influenced by abnormal postural relationships, in the possible ultimate development of malignancy. In cancer of the skin and respiratory system it does not seem so likely that postural abnormalities are influencing factors, but the organs previously mentioned present more than 75 percent of all cancer recorded in the United States.

CANCER DEATHS PER 100,000

Localities	Population Per Year	Foot Deforming Characteristics In Those Localities
Switzerland	176.0	Most elements of the population in these localities, wear modern deforming shoes from cradle to grave.
England and Wales	172.3	
Austria	164.2	
Boston, Mass.	180.9	
Denmark	147.4	
Italy	86.2	Large elements of the population either go barefooted or wear non-deforming sandals a large part of their lives.
Japan	70.9	
Hawaii	67.2	
Greece	52.3	
Costa Rica	62.8	
Rumania	43.8	Predominate elements of the population either go barefooted or wear non-deforming sandals. The cancer rate may be as high as it is, only because of the European and American shoes worn in large cities.
Venezuela	25.8	
Egypt	23.2	
Peru	14.0	
El Salvador	12.9	
Ceylon	11.3	

Source of Cancer Mortality Data—U.S.P.H.S., National Office of Vital Statistics, Summary of International Vital Statistics 1937-1944. (Cancer mortality rates must be considered as an approximation, since cancer diagnosing ability on a regional basis varies.)
Source of Data on Footwear Customs—Entire file of *National Geographic Magazine.*

Summary

1. There appears to be some statistical and ethnographical relationship between the wearing of shoes and the incidence of cancer.
2. Foot disorders can cause serious mechanical derangements and strains not only in the feet and legs but also in anatomically distant organs of the body.
3. Such mechanical pathologies may be pre-disposing factors in the formation of some cancers.
4. There is a definite need for further research into the possible relationships, herein outlined, between foot troubles and cancer formation.

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PAIN AND CHEMICAL CHANGES

PRODUCTION of pain appears to be associated with local chemical changes within the abnormal tissue foci. Apparently the tissue pH may alter toward acidity or alkalinity. Factors such as time of day and food intake that affect the acid-base balance of the body may also influence the intensity of pain. In comparing urine pH with the degree of pain felt by patients, Dr. Emanuel Revici and associates of Institute of Applied Biology, Brooklyn, find two distinct pain patterns, one acid and the other alkaline. Administration of alkalinizing agents increases alkaline pain and relieves acid pain while acidifying agents have the opposite effect. The action appears to bear directly on the abnormal foci rather than on structures conducting the pain impulse since both patterns may coexist in the same individual, varying simultaneously but in opposite directions.

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WOUND HEALING

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THE SUBJECT of wound healing embraces not only the operative technique of the surgeon but also the preoperative and postoperative care of the patient. It has been pointed out that there are four factors to be considered in wound healing: first, the patient; second, the wound; third, the suture material; and fourth, the technique.

In the healing of wounds, the first or lag period is characterized by inflammation and exudation that lasts four or five days. The regenerative phase is characterized by fibroplasia. The strength of a well sutured wound is 40% of that of the uncut tissues. Where absorbable suture is used the tensile strength drops 20% to 25% of the original by the 4th postoperative day. Fibroplasia begins on the 5th day, and by the 6th day the wound has regained 50%, and by the 10th day 90% of its normal strength.

Age frequently effects wound healing because wounds tend to heal more slowly in older patients, therefore every effort must be made to improve nutrition. Fluid and electrolyte balance are extremely important because on the one hand dehydration disturbs intercellular salt and fluid balance, and overhydration causes edema of the tissues and delays the onset and progress of fibroplasia.

Proteins are extremely important in wound healing. Hypoproteinemia causes a retardation of wound healing. If the patient is in negative nitrogen balance, wound disruption may result. Blood protein determinations aid in estimating the state of nutrition of the patient, but they are not a true index of protein metabolism because they do not indicate the degree of depletion that has occurred in the body reservoir. Weight loss is the best clinical manifestation that the proteins of the tissues are deficient. Hypoproteinemia may cause an increase in the lag period of healing, and the lowered tensile strength of wounds noted in protein deficient rats during the 3rd and 5th postoperative day is apparently due to a diminution in the number of fibroblasts, a decrease in their rate of maturation, and a general failure of the fibroblasts to organize.

Tissue and plasma protein deficiency may occur even in the presence of adequate protein intake. The rate and degree of growth of fibroblasts in wounds may be increased by an augmented protein intake.

The importance of vitamin C in wound healing has been well demonstrated in the histological study of scorbutic rats. In these animals there has been complete growth of surface epithelium, with blood clots showing little or no organization, and the fascial scars showed many cells but only a little development of collagen. The tensile strength of wounds with vitamin C deficiency is greatly diminished. The intercellular substance in general, and especially in the capillary bed, and the collagen of all fibrous tissues requires ascorbic acid for production and maintenance.

Vitamin K levels may also be important because wounds will not heal in the presence of continued bleeding.

Patients with chronic anemia will naturally have impaired wound healing.

Repair of Special Tissues

Epithelium has marked powers of regeneration. In the skin and mucous membrane, repair is rapid, and complete restoration of the typical cellular arrangement usually results.

Muscle cells do not take part in the process of repair. Outgrowths of the fibrous tissues of the muscle sheaths and the partitions between groups of muscle fibers form the new fibrous tissue which unites the separated muscle. All necrotic or severely damaged muscle in a wound should therefore be removed because it will not regenerate and its presence will only retard healing and increase the amount of scarring.

Tendon repair. After the division or rupture of a tendon, exudate and blood fill the space between the ends. A moderately rapid growth of granulation tissue replaces the exudate and soon fibroblastic proliferation into the granulation tissue occurs. The growth about the ends of the tendon frequently resembles in shape the callous formation in fractures.

Soon the new tissue becomes avascular and takes on the characteristic tendinous form. The increase in the length of the tendon under such circumstances frequently leads to loss of function.

If approximation of the ends is not accurate, instead of normal healing, scar tissue forms penetrating into the surrounding tissue and resulting in loss of function. To avoid this, the tendon should be carefully sutured, or if retraction has been too great or a part of the tendon has been lost so that the ends cannot be approximated, the gap should be bridged by tendon graft or tendon plastic procedures.

Bone repair. Fractures are usually associated with more or less laceration of the periosteum and trauma to the surrounding soft parts and a clot forms between the ends of the fractured bone. Shortly thereafter an exudate from the vessels occurs and there is swelling of the surrounding tissue with a typical proliferation of connective tissue from the endosteum, the periosteum, and the Haversian canals, with the formation of capillary buds.

The cells of the periosteum and endosteum have osteogenic properties and from these osteoblasts new bone tissue forms; the clot is absorbed and repaired by vascular and osteoid tissue.

The osteoblasts have fibrils which extend in all directions, and these fibrils, as well as the cells themselves, become imbedded in a homogenous matrix. When calcium salts are deposited within the osteoid tissue, it becomes the "callus," a spongy osseous tissue. The calcium then undergoes partial absorption as new and firmer bone is laid down within it, and the external callus is absorbed until the normal contour of the bone is restored.

Nervous tissue repair. Nerve cells which have been destroyed are never replaced. However, the various parts of a cell may regenerate if the cell itself remains intact. When a peripheral nerve is divided, therefore, the axons will grow in a peripheral direction and function will be restored. As in other highly specialized tissues, the connective tissue, which grows more rapidly than the specialized tissue, may surround the end of the growing nerve and check further growth.

Healing by First Intention

1. After careful hemostasis the wound surfaces are brought together.
2. Adjacent surfaces become glued to one another by a thin layer of coagulum which contains leucocytes, red blood cells and fibrin.
3. As this dries, some of the coagulum may exude from the wound surface and form a protecting scab.
4. Some lymph exudes into the wound, but this is usually a small amount in a cleanly excised wound.
5. Soon the connective tissue cells begin to divide by mitosis and fibroblasts grow along and into the fibrin trabeculae which are gradually absorbed by the fibroblasts and macrophages.
6. Capillary buds are formed, but in a wound made by a sharp incision, little new vascular invasion is necessary.
7. Fibroblasts grow from one surface to mingle with those of the opposite side, producing collagen fibers which effect a permanent union.
8. The new tissue that forms during healing is bright red, soft and friable and is called granulation tissue. There is only a small amount in the wound that heals by first intention.
9. Epithelial cells finally proliferate to cover the wound.
10. This process in a clean wound that is not too large, is usually completed in five or six days. Howes, Sooy, and Harvey have found that there is a "lag period" of from four to six days between the initial injury and the beginning of the diminution of the surface area of the wound. During this lag period sutures are necessary for the reinforcement of the wound.
11. The fibrous tissue which results from healing gradually contracts, squeezing the new capillaries until they are obliterated. This may continue for an indefinite period, perhaps as long as a year.
12. Scar tissue is never as resistant to tension as normal tissue, and, if present in any amount, may prove to be a vulnerable point in any area subject to pressure or tension.

Healing by Second Intention

1. If the loss of tissue has been so extensive as to prevent accurate approximation, or if infection develops, primary union does not occur and healing is then said to be by second intention.
2. When a tissue defect is present, the reactions of repair are similar to those observed in healing by primary intention, but are greater and more prolonged in duration.
3. In infected wounds the extent and virulence of the infection determines the degree of retardation of wound repair.
4. In the presence of infection, there is an outpouring of exudate and a migration of polymorphonuclear leucocytes into the wound, and this, together with tissue debris, makes up the pus which is found in such wounds.
5. When the infection has been overcome the filling of the wound will proceed again with the formation of granulation tissue.
6. More scar tissue is present.
7. Epithelization occurs on the surface only when the depths of the wound are filled with granulated tissue.

Healing by Third Intention—Secondary Suture

Occasionally a wound is left open for some purpose and in a few days the granulating surfaces are sutured together. After infection or delayed healing, the granulating surfaces are approximated to hasten healing and to lessen the formation of fibrous tissue. This is known as secondary suture or healing by third intention.

Local Factors Which Affect Wound Healing

1. The amount of necrotic and damaged tissue in and around the wound is related to healing.
2. The amount and character of the exudate in the wound space and in the bordering tissues is immensely important.
3. The number and virulence of infective bacteria in the wound and in the bordering spaces, and the number and character of foreign bodies in the wound which must be extruded or encapsulated, all are important factors.
4. The position of the wound, the type of suture material and the tension on the wound as well as its size are additional factors.
5. The vascularity of the tissues is another element; for the more abundant the capillary bed, the more rapid repair. The integrity of the blood supply determines the nutrition and viability of tissues bordering on the surfaces of the wound.

Conclusions

Surgical methods may help or hinder healing, because:

1. The wound must be held together during the lag period by mechanical means: sutures, splinting or constantly maintained pressure.
2. Surgical methods must be carried out with the least damage to wound surfaces and bordering tissue, maintenance of maximal nutrition and adequate blood supply, minimal foreign body reaction, and maintenance of rest of immobilization for an adequate period.
3. Common mistakes include: suturing wound edges and individual layers too tightly; using suture material out of all proportion to the holding strength of the tissues; crushing by hemostats; inadequate hemostasis; lack of asepsis; interruption of blood supply, improperly placed incisions and lack of thorough debridement.

In conclusion, to handle surgical wounds properly the surgeon must begin first with the general nutrition and well being of his patient; then he must have an adequate operative technique which will give the wound its best chance to heal. Having done this, he must maintain the advantage he has gained with proper postoperative care of both the wound and the patient.

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NEW METHODS OF MUSCULAR REGENERATION FOR EQUILIBRIUM BY ELECTRO-THERAPY

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DELIVERING a talk on electro-kinetics, minus demonstrations, is like kissing your mother through a handkerchief. The preferred method is best conveyed to doctors when delivered in small groups, where the lecturer has been able to demonstrate the treatment and its effects on each individual; and not to an audience as large as this. A practitioner, in order to set up patterns of correct neuro-muscular function, must himself go through the sensations he expects his patients to experience. This is especially valuable since 80 percent of our patients fall into the field of minor deviations from the normal, and not those having gross pathology.

No living thing can be static and survive. How the body lives is determined by the way it sits, walks and stands. We arrive at an opinion of an individual by the shape and action of his body. As we watch people we place them socially, economically and also their philosophy of life. The artist over-emphasizes the face of man, but our individual mental picture recalls the whole body and its familiar activities. We remember people not by their faces, but by their bodies in action: A Fred Astaire as dancing, a Babe Ruth as batting, a Nurmi as running. We recall our parents not so much by their faces but their bodies in action, going for their accustomed chairs, eating, sewing, smoking, going through familiar activities.

The voluntary muscles of our legs act automatically. As they act, they move bone on bone. How we move and center our bones is in many cases a self-expression of our mental and emotional make-up, our experiences and prejudices. Therefore, in order for our bodies to maintain a state of equilibrium our bodies must overcome mechanical physiological and psychological factors.

The body is constantly attempting to balance various forces. Every force is constantly being balanced by an opposite force, to either maintain his upright structure in a static position or during locomotion. This equilibrium conserves nervous energy and as a result improves everything he does physically and mentally.

Since we know that function determines form, these forces are responsible for the morphology or shape and density of the form. In order to control the form, or create a change in the form we must be able to control these forces, we must understand the structure, the materials as well as the functioning organism. In our functioning organism, we have a receiving and responding instrument. The receiving is the nerve, and the responding is the muscle. In the receiving end we also concern ourselves with a stimulus. All movement in man is the result of some stimulus, either intrinsic or extrinsic to the body.

We use as our stimulus a polarized electrical impulse. With this current we determine the extent of the disability objectively, the prognosis, and this current outlines the most suitable treatment we are to follow. Also this electro-analysis determines for us the path of torque, the exact functional activity of each limb, the group interplay of prime movers and regulating muscles in each limb.

In order to maintain equilibrium, our muscles must continuously be in a state of tone because of the instability created by the segments of our body, the double curvature of the vertebral column, the pyramidical shape, small area of our base of support and also to the fact that our center of gravity is rather high. Equilibrium is greatly aided if our line of gravity falls within the base of support created by the feet.

In the sitting attitude the base of support is greater and therefore stability is increased, and less taxing on the musculature. In the supine position we have the greatest base of support for the body and therefore the least expenditure of muscular energy.

Greater inclination of the body is possible when the heels are separated than when they are together. In the kyphotic we find that they throw themselves slightly backwards.

The overweight individual develops a torsion as he walks, and to reduce the amount of this rotation, develops a spastic and short-paced gait. In the elderly individual we find dependency on a cane. In all these cases the effort to maintain equilibrium is great and therefore causes rapid fatigue.

Disturbing equilibrium of our body results in movement. Basically, human locomotion is a disturbance of mechanical equilibrium of the body causing a displacement of the legs, which alternately carry the body.

In chiropody we have often called upon Davis and Wolff's Laws. The strange thing is that the common denominator of both these laws is function.

Walking is the most important function of the lower limbs. The lower extremities have therefore been called "The organs of locomotion." In

coordinated gait there is remarkable well-timed, smooth action of contributing muscles and joints. With each individual step there is constantly being prepared the way for the next step, lessening the fatigue than if we walked by a series of independent movements. With alternate flexion and extension of limbs, forward progression flows on without fatigue like a smooth running stream.

Man is intended to be a walker. More than half of the body's muscular structure has been designed and planned by the body for the sole purpose of moving thighs, legs and feet. For that reason, walking is called the perfect exercise.

The involved muscles take in so wide an area, the amount of strength needed is surprisingly small, that it should be impossible to over-fatigue any one set of muscles.

The gait of the patient is also one of the most important symptoms of concern to the medical diagnostician. Characteristic tumors, pregnancy, obesity, rheumatism, sciatica, hip or knee joint disease or injury, metatarsalgia, locomotor ataxia, diseases of the brain, anemia, chronic mental or physical defects, etc.

Equilibrium in locomotion is difficult to attain and easily lost, as attested by the fact that it takes almost two years for a human being to develop balance gait.

The most common subjective functional symptom in our offices is the difficulties encountered by the patient in walking. There is lack of symmetry in all people. This imperfection varies in amount to the point where the patient becomes conscious of its presence. Animals also lack symmetry. When running, their bodies twist and run at an angle and never in a straight line. And in man, this imperfection is exaggerated by the fact that he walks only on two legs. One leg always tends to outwalk the other, so that a human being walks in a circle.

Creating symmetry or coordination in locomotion is of greater importance than the development of strength. Therefore, regeneration of muscle tissue by contractile currents in the lower extremity should be along the lines of development of coordination as the primary goal in the treatment of every patient.

A patient that develops even a microscopic limp from a small heloma, callosity, ingrown nail or verruca, creates a permanent functional pattern of the gait in his cerebral cortex, unless overcorrected in the opposite direction by direct therapy to the involved musculature. This electrotherapy must be applied accurately graded to the rhythm of the patient's neuromuscular system.

The human being develops equilibrium by educating his cerebral cortex and therefore learns to walk entirely different than other mammals who are able to walk as soon as their eyes are open. In the mammal, it is dependent upon spinal reflex and instinct. In the child, learning to walk is just like learning to swim, by cortical education and control. Once having developed the cortex in order to walk, it remains dependent on the cortex to maintain the pattern for coordinate gait during the rest of its life.

To further development of equilibrium, the muscles concerned with locomotion come in pairs. Perfect gait would be in those individuals having equalized tone in each pair of muscles producing coordination during locomotion. The involved muscles in locomotion take in so wide

an area the amount of strength needed is surprisingly small, that it should be impossible to overfatigue any one set of muscles. To repeat: coordination in locomotion is of greater importance than development of strength.

In order to understand how we are going to coordinate the gait, it is appropriate for us to review the gross action of the limbs during gait.

Terrestrial locomotion can be divided into: (1) walking, (2) crawling, (3) running, (4) jumping, (5) climbing.

The two main departments that we are interested in affecting are walking and running.

In walking progression, the stride which is a double step is divided into three phases:

(1) The support of one leg.
(2) The double support.
(3) The support of the opposite leg.

If in ordinary walking (121 paces per minute), we were to consider the stride as taking one second, each pace would take 5/10 which would include 2/10 during which time the double support manifests itself. The double support is the greatest characteristic feature in normal gait, and the one feature that distinguishes it from all other modes of progression. The double support takes place during the two supporting phases. During this phase both legs are contacting the ground.

The double support varies. In extremely slow walks it is about one-half as long as the one of standing on one leg. The more rapid the gait, the smaller the period of double support. In walking with a load we find the length of the pace decreased, support of each leg increased and the double support greatly increased.

Contractions of soleus, gastrocnemeus and tibialus posticus are greatly increased under a load. This double support is of great importance in gait. It has been found that at 200 paces per minute the double support is 50/1000 of a second; at 80 paces per minute it is 175/1000 of a second.

In walking the two supporting phases No. 1 and No. 3 are never so arranged that one begins at the precise moment of the ending in the opposite limb. When this does take place, then we are no longer walking. We are in the "running mode of progression."

In the running mode, the greatest characteristic is not its speed, but that the double support completely disappears. We find here the same single support, in rhythmic alternation, but instead of double support, we have a period called "suspension." During this short period, the body is actually floating in the air without support, that is, both feet are off the ground for about 1/10th of a second. As we grow older we lose this due to insufficient usage in the action of the gluteus, medium, minimus; semi-tendonosis and semi-membranosis which keep the pelvis from dropping. The weight of the torso then is permitted to be maintained by the ligaments. For that reason, running is very difficult in elderly people.

Walking is easier and less fatiguing than standing. Standing is hard work. In standing our muscles must be held continuously contracted, since the normal function of muscle tissue is alternate periods of contraction and relaxation. Therefore, in standing, where there is a continuous contraction, we quickly develop fatigue and impairment. However, as a

developing phase of treatment, we should attempt to improve our muscle tissue in the balance dimension, to enable the muscles to maintain the upright position for longer periods of time due to occupational demands. In this dimension all necessary aids such as shoe therapy, appliances and strappings, should be brought into the picture primarily to remove all possible strains in attempting to balance this flexible, delicately poised mechanism in addition to the important dynamic training of the muscles by low voltage therapy.

Two important physiological rules that must be made use of in the control of gait are:

1. That the law of use is the law of maintenance. Your patients maintain that which they use, and lose that which they fail to use. Man is dynamic, not static. Therefore, our diagnosis and therapies to affect a change, must, for the greater portion, be dynamic.
2. The law of crossed extensions and flexions. When we produce a lengthening reaction in the extensors of one leg, a shortening reaction occurs in the extensors of the opposite limb. Conversely, the stimulus which sets up a shortening reaction of one limb causes a lengthening reaction of the opposite extensors. This crossed extension and flexion comes under circumstances of walking and running. When one limb is flexed, the opposite limb extends to support the weight of the body. This crossed extension and flexion gives us the necessary rhythm and harmony in the fine muscular adjustment to produce synchronized gait.

Wherever we are concerned with continuing an action over a long period of time, rhythm must be relied upon. As an example, the beat of the heart which even as it works continuously, awake or asleep, actually by its rhythm works nine hours and rests fifteen hours per day. The rhythm of contraction and relaxation in systole and diastole enables it to keep going a lifetime. There is also the rhythm of breathing. You never tire of that action. We have a rhythm in walking, which if maintained, can enable us to keep going during consciousness.

If we are to consider the lower limbs as pendulums, then we are to expect a child or a short individual to swing his legs quicker than a tall individual, and the child will take more steps to the minute. Therefore, we find that there is a natural rhythm or cadence according to the length of our legs which oscillate or beat slow or fast, depending upon their length.

Because gait is a constant falling and constant self-recovery, it becomes:

1. Intricate, because there are actions and counteractions going on at the same time.
2. Sharp or acute. Gait is an acute sensation. We realize this when we alter slightly our familiar ground, as, for example, when we step into a fast moving stream of water or a small wave at the shore. We then have to labor to keep upright.
3. A hazardous procedure. We realize this if we attempt to walk on a smooth, icy surface. We may slip and injure ourselves, or if we overlook a step on a staircase, we discover the amount of force that has thrown us forward.

Man tries to avoid these dangers by continuously practicing walking from the state of infancy.

It has been argued that symmetry in the lower extremities may not be necessary since we do not have functional symmetry in our upper limbs, but it has been physiologically proven that the great majority are right-handed due to an instinct of protection in regard to the heart. But in the lower extremity, the basic etiology of the great majority of deformities is the result of forces inflicted suddenly or continuously applied to the body. It must follow that unless the action of the two lower limbs is similar, there will be an inclination for the stronger side to force the weaker from the upright position; distortion and deformity must develop.

As a prophylactic measure and in the majority of cases as a curative measure, the goal for every patient should be correct stepping.

HEMOSTASIS WITH ABSORBABLE MATERIAL IN OPERATIONS ON THE FOOT

A. GOTTLIEB, M.D.
Los Angeles, Calif.

THE smaller an operative wound area, the more difficult the control of capillary bleeding. Oozing of blood from cancellous bone after resection of an exostosis or partial removal of the ondyle of a phalanx of a metatarsal bone has always been a difficult problem in operations on the foot. A similar problem is encountered in operations on soft tissues and in dissection of loose pieces of bone from connective tissue. The bleeding not only interferes with the surgeon's view, but forms tiny pools which hamper wound healing.

The bleeding capillaries may be too small to be caught and ligated, and if the oozing originates from cancellous bone the capillaries may be inaccessible for clamping and ligation. Pressure applied to the bleeding surface may help somewhat, and a pressure bandage after the wound is closed may control the minute hemorrhage. But these measures have only limited value; and, as to a compression bandage over a dressing, there is the disadvantage that it may become too tight and cause pain.

Oxidized cellulose gauze and absorbable gelatin sponges offer a very welcome solution to the problem. Either of these substances may be placed in the wound to stop bleeding and left there to be absorbed eventually by the tissues.

Technique

A pledget of the proper size is cut from the material in bulk, placed on the bleeding surface and pressed down by the gloved finger covered with sterile gauze. It will stick to the wound and absorb the oozing blood. Left in place and the wound closed over it, it will gradually be absorbed and disappear from the tissues.

In cases in which it is desirable to put thrombin or penicillin into the wound, this may be done by immersing the gelatin sponge pledget in a solution of either or both of these drugs before it is pressed into place and the wound closed over it. The thrombin solution used by the author is made by dissolving 1,500 units of thrombin powder in 15 cc. of normal saline solution. If an antibiotic is indicated, penicillin is added,

200 units or more to each cubic centimeter of the thrombin-saline solution.

The author has used oxidized cellulose gauze and absorbable gelatin sponges, in the manner described, in bunionectomy, arthrectomy, sesamoidectomy, calcaneal exostotomy and a variety of other operative procedures on the foot. In no case was delay in wound healing or other complication encountered.

Summary

Oxidized cellulose gauze and absorbable gelatin sponges may be pressed into small operative wounds in the foot to control capillary ooze of blood that otherwise presents difficulties in such procedures.

The material may be left in place to be absorbed by the surrounding tissues after the wound is closed over it.

Pledgets of gelatin sponge soaked in solutions of thrombin or penicillin or both may be used to hold these drugs within a wound if use of them is indicated.

727 West Seventh Street.

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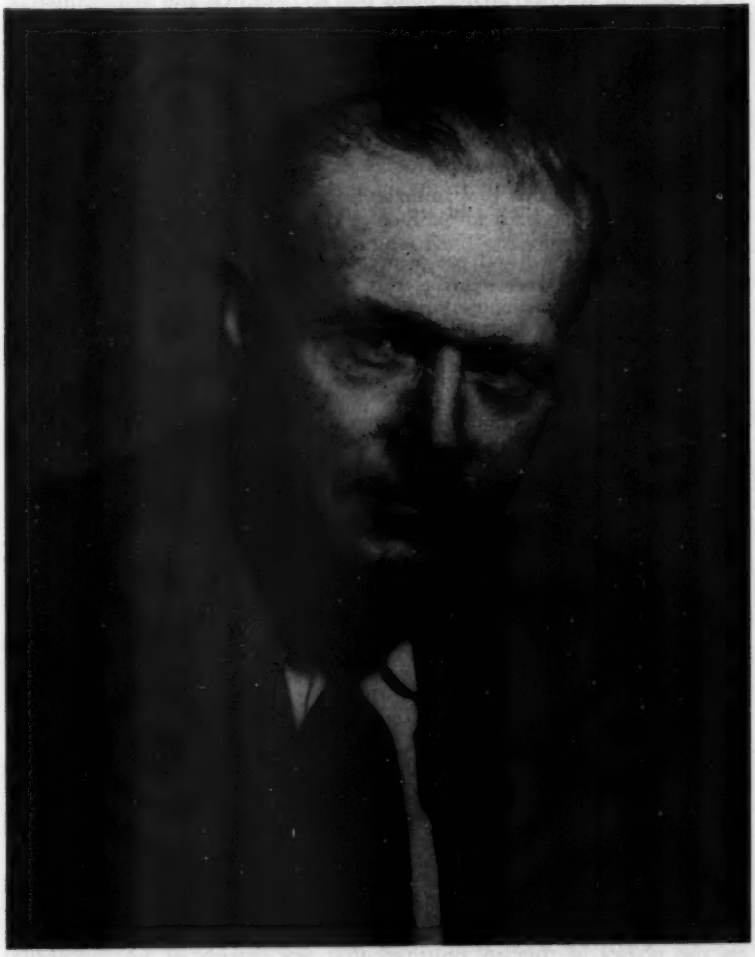
PRESIDENT'S MESSAGE

Reflections

WHEN we think of that wonderful composite of masterful engineering which is referred to as the human body, we cannot help but wonder why such a magnificent creation is regarded so light by those who possess it or by those who are in any way connected with its continued operation and function. It is a most complex mechanism with hundreds of different types of cells and structures which through coordinated operation make up the creature called "man." As chiropodists we are at times inclined to think of problems of the lower extremities as entities separate from the rest of the body. When examination gives evidence of diabetes, leutic involvement, or some other systemic manifestation, we should immediately tie feet into the general body picture. This is not always true when we consider the variance in structural alignment of the foot, postural and muscular imbalance, symptomatic manifestations, such as heloma durum, heloma molle, metatarsalgia, Morton's toe, etc., which produce great pain and discomfort.

In diagnosis it is axiomatic that we cannot consider separately any single part of the body without taking into consideration the rest of the structure. If we fail to make such consideration then a correct diagnosis may elude us. Until we are able to make a correct diagnosis treatment must of necessity be haphazard.

In the practice of chiropody the most common lesion found is heloma durum. A patient may complain of excruciating pain from such lesion. Examination reflects a minute growth that seems all out of proportion to the amount of pain suffered. Why? Another patient also presents a heloma durum. This lesion is large—in fact overly large. You ask, "Is it painful"? The patient replies "Yes, a little." Why? This brings home



L. A. WALSH, D.S.C.
President

the realization that it is not always the size, depth or position of the lesion which causes the pain, but rather it is the difference in individuals who have the excrescences which must be considered.

Problems of everyday living, home life, sex, business and social contacts, etc., very definitely affect and influence the health of an individual. In the scope of health we have everything from heart ailments to foot disorders. Phobias and complexes in a patient's makeup can often influence the results of treatment. Those who have obsessions about what is wrong with them frequently try to do the diagnosing for the doctor and wonder why no one understands them or is able to discover the cause of their particular condition. Many patients have phobias about their feet. Such phobias differ considerably in the manner of presentation by the patient, but fundamentally they add up to important diagnostic information when properly analyzed.

I recall that upon hundreds of occasions when I told women patients that the shoes they were wearing were much too narrow or too short and as such were a strong contributing factor to the foot trouble that was making them miserable. This assertion usually produced a reaction that took some time to clear away. These women told me that they always took special pains to get large and roomy shoes. Why they can wiggle their toes all around! In fact they did everything within the scope of their imagination to convince me that their shoes were not the cause of the trouble. It had to be something else. Obviously this is the expression of a phobia that exists in the minds of many female patients. After listening to the patient's arguments I asked them to stand on a paper towel placed on the floor. A pencil outline of the foot is drawn. The shoes the patients were wearing were then placed over the marked outline and Miss or Mrs. Patient were shown how much wider their feet were than the shoes which had been placed over them. Since seeing is usually believing, the patient will make concessions and new and proper footgear can be obtained.

What holds true in the matter of proper fitting also holds true in other phases of patient analysis. There are many patients whose visits to the chiropodist's office are a matter of routine—once a month, twice, or in some cases weekly. Among them we have a number of patient classifications. There are those who insist on wearing improper footgear and are willing to pay the penalty through frequent visits for treatment. They are perfectly satisfied with such an arrangement and will not consider corrective therapy. Another group who, because of deformities beyond the corrective stage, are satisfied just to obtain relief. There are others who have conditions which can be corrected but who have never been informed that a corrective program could be instituted. This of course is the fault of the doctor for not recognizing and securing consultation on the phases of therapy required that are outside of his individual ability to provide. All chiropodists do not perform surgery or do postural and muscular rehabilitative work. However, we have many practitioners specializing in these fields who will gladly cooperate.

We have still another type of patient whose condition never seems to improve (or become worse) no matter what type of therapy is used. They invariably complain that when the heloma is better the hallux valgus gets worse. When the bunions are behaving, the arches go on a rampage, and so it goes. This type are usually females, age fifty or over, and nine

out of ten of them are mothers with families. Fundamentally they show a protective complex. If a careful check is made we often find that mother, who was so necessary and important in early life and who was consulted and waited upon by her children up to and through their teens, now find that in adult life her children have apparently more or less overlooked her. Perhaps she has a fall, twists her ankle, or has a fainting spell, with the result that her children immediately shower her with attention, concern and show deep interest. Mothers are instinctively smart and when they observe that having something wrong with them keeps the family group attentive and concerned, they sometimes purposely keep something going wrong. Often the trouble centers on the feet.

After analysis it is not hard to understand why certain types of patients never get any better but always keep coming for treatment. What started as a plan to get attention can become a fixed obsession in the course of time. This is just one of the many forms of neurosis which confront us in our daily practice.

Another condition found more frequently in women than in men is Morton's toe or Morton's neuralgia. It was originally described as an impingement of a branch of the plantar nerve between the heads of the 3rd-4th toes or 4th-5th toes of either foot, starting with a numbness or tingling and working up to a cramp or spasm which shoots through the toes with such excruciating pain that it is often necessary to remove the shoe and squeeze or massage the foot for relief. Such spasms occur with varying frequency. Present-day observations indicate that Dr. Morton was far from right in his estimate of the cause. Fluoroscopic examination of patients so afflicted, made while standing with the shoes on and off (in the actual act of the take-off in walking), often show that sufficient space is present between the affected heads to make impingement impossible. The writer has observed, over a period of years, that in practically all of these cases cuboid or cuneiform lesions were present in the affected foot. In more than seventy percent of the cases examined a sacroiliac involvement was present, causing postural imbalance and shifting extra weight on to the affected foot. In about thirty percent of these patients contraction of the fascia and ileo-tibial band was present. In some twelve percent a diagnosis of neuroma was reached through the process of elimination. However, the most important observation to my way of thinking has been that in every case of Dr. Morton's toe, I found evidence of a neurosis in the general makeup of the patient.

With this in mind it is not hard to understand why a successful therapy has not been developed to cope with such conditions. When I realized that this was the case, favorable results were stepped up immeasurably by treating the neurosis as well as the toe. This can be done by psychoanalysis and physical therapy. My results have been gratifying. A celebrated food authority made the statement that "you are what you eat." We may not agree with this but I think we can agree that "we feel as we think." There are many examples of the effects of mind over matter. For example, the writer, through hypnosis has demonstrated how circulation of blood, contracting and relaxation of tissue, etc., can be affected by subconscious suggestion. On the other hand much can be done through the medium of conscious suggestion. These subjects are beyond the scope of this paper.

It is not my intention to give the impression that our individual practices are bogged down with neurotics. We must however realize that our mental institutions are taxed to the utmost. As civilization develops, culture and the intellectual possibilities of people increase. So do the possibilities of fault. There are those we can help for conditions that are both real and imaginary and it is our responsibility to differentiate and help in both instances.

DR. LESTER A. WALSH

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Belnap, Howard K.,
Rocky Mountain Medical Journal,
47: 5, 361. May, 1950.

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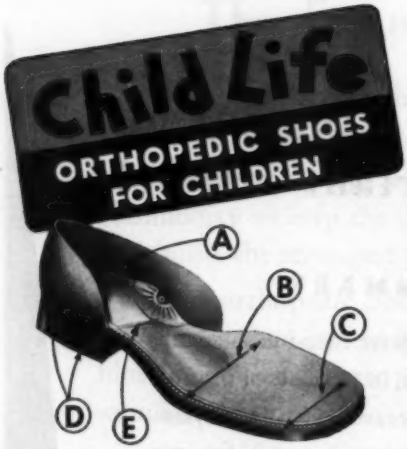

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A LONG INSIDE COUNTER, molded to the last, gives added support to prevent pronation.

B SCIENTIFICALLY DESIGNED METATARSAL AREA, correctly supports and aligns the metatarsals; extra width at ball allows freedom of foot action. No crowding, no cramping, no constriction of nerves or muscles.

C BROAD TOE AREA, room for toes to grow straight and strong with no interference to free function.

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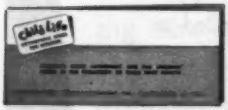

Write for Your Copy of the CHILD LIFE Booklet showing shoes and special features, and Authentic Wedge Chart.

There are 21 CHILD ORTHOPEDIC STYLES IN STOCK, in all sizes and widths.

HERBST SHOE MFG. CO., Milwaukee 45, Wis.

AMERICAN FOOT HEALTH FOUNDATION BACKED BY THREE GROUPS IN CAMPAIGN FOR FUNDS

THE American Foot Health Foundation instituted a campaign to raise funds several months ago. That campaign is now slowly getting under way. In the meantime the Foundation has been making definite progress in several directions and building a firm groundwork for the future welfare of chiropody. Activity has been limited because of the need for avoiding errors. It must be remembered that there are no precedents to follow in developing this important phase of our professional organization. We are reluctant to make policies, decisions or errors which would in any way reflect upon the integrity of the A.F.H.F. and thus hinder its important purposes.

The directors of the Foundation are pleased with the number of voluntary contributions received to date. These were obtained without pressure from any source. The need for funds is great. Once money is available all of the various projects on our agenda will gradually be started. At this time we would like to appeal to all state organizations and individual members to contribute individually or collectively to the best of their ability. Membership cards will be sent to contributors—the amount of the contribution being designated by the color of the card.

The Foundation was organized several years ago and approved by the House of Delegates at Louisville in 1948. A temporary organization structure was created in August 1949 at the Chicago meeting of the N.A.C.

CHIROPODISTS *Recommend*

HEALTH SPOT SHOES
FOR MEN, WOMEN AND CHILDREN

Because Health Spot Shoe dealers are trained to recognize the need for sending their customers to consult a Chiropodist when they have foot trouble.

Chiropodists know that Health Spot Shoes are strong enough to support the insets and corrective devices necessary to correct a patient's foot ailments. They know, too, that Health Spot Shoes are constructed of the highest quality material for long durable wear.

ONE OF THE BOOKLETS GIVEN TO EVERY HEALTH SPOT CUSTOMER CARRIES THE FOLLOWING:

If you have painful feet, a visit to a Chiropodist will pay wonderful dividends in foot comfort, for he is a specialist, scientifically trained and legally licensed to treat ailments of the feet. Conditions such as corns, callouses, bunions, ingrowing nails, infections, swellings, burns, cuts, "fallen arches," tumors, warts, skin diseases, flat feet, and many other foot conditions are treated by the Chiropodist.

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HEALTH SPOT SHOE COMPANY
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DYNAMIC FOOT APPLIANCE

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Added to our *complete line of Custom Leather and Celastic Foot Appliances*

LOOK AT THESE *UNIQUE* SPECIFICATIONS:

- Dynamic appliance. Causes the toes to grasp with each step . . . causes muscular function.
- A balanced inlay, having features many steps in advance of present inlays.
- The buttress, which comes up into the web of the foot, prevents the foot from elongating on full weight bearing. The longitudinal is built up according to the cast (plantar cast—semi-weight bearing). No metatarsal build-up used for the majority of cases.
- The most individualized appliance in appearance and construction of any appliance on the market.
- Takes up LESS room in shoes than any other conventional type of inlay or appliance.
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- Featherweight (less than 4 ounces per pair).
- Rugged enough to withstand the hardest wear . . . constructed of top-grade belt leather with a waterproof finish.

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Manufacturing Custom Foot Appliances

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As our plans mature we believe that the accomplishments of the Foundation will adequately repay any individual or group which aids us financially. It is interesting to report that in the past eight weeks three widely different groups have become *"firsts"* among those contributing to the support of the A.F.H.F.

(1) At its annual business session the Missouri Association of Chiropodists unanimously voted to contribute $100.00. This is the first affiliated state society to make a group contribution.

(2) The 1950 graduating class of Ohio College of Chiropody presented Dr. N. C. MacBane with a check for $200.00 before leaving their alma mater and going forth to become active members of the profession. They are the first student group to support the Foundation.

(3) Two tiny tots, Dorothy Ann MacBane and Danny Markley, grandchildren of two chiropodists, have each donated a dollar, thus becoming "firsts" among the next generation to support the Foundation's program. One of our most important activities will be the prevention of foot disorders in children.

The writer firmly believes that when sufficient financial support for the Foundation has been received from the N.A.C. membership that certain outstanding accomplishments may be expected. We will then be able to obtain adequate assistance to handle the various problems which confront us. When the Foundation is in full operation many of the smaller problems affecting the N.A.C. will be excellently handled through the financial assistance of the A.F.H.F. In services rendered we will be able to give back to the profession, the N.A.C. and the individual members, many benefits which may otherwise not materialize.

In conclusion I wish to again appeal to each member to contribute as generously as possible. Send your checks at once so that we may expand this fine program.

DeLisle L. Mrazek, D.S.C.,
Secretary-Treasurer
American Foot Health Foundation
4065 So. Grand Blvd.,
St. Louis 18, Missouri

REMINDER—SEND ANNUAL DUES TO YOUR STATE SECRETARY OR TREASURER

THE N.A.C. fiscal year ended May 31, 1950. Dues for 1950-51 were due June first. Members are requested to forward their checks as soon as possible to their respective State Society Secretary or Treasurer.

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EXTRA DEPTH IN FOREPART

Special last design provides extra room at the throat and over the toes across the entire treading area, allowing room for inlays, balancers and other foot appliances, without crowding the foot. There is no need, now, of misfitting with oversize shoes to accommodate foot appliances.

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EDWARD'S INLAY-DEPTH lasts provide an extra ⅛" depth at the heel seat, thus preventing slipping at the heel and also accommodating corrections and appliances extending under the heel.

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enable you to insert inlays, balancers and other foot appliances without using an oversize shoe and without foot distortion, strain, cramping or pinching. EDWARD'S INLAY-DEPTH SHOES provide the extra room needed to accommodate the appliance and still give snug comfortable fit across the instep, around the ankle and at the heel.

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BOOK NOTICE

Carleton's "A Graphic Handbook of Practical Foot Orthopedics." A symptomatic approach to diagnosis and treatment of everyday foot orthopedic practice.

Coming off press in September. A new type of textbook—graphic, modern in presentation, patterned after the popular pictorial journalism of today—a minimum of text with a maximum of pictorial explanation—about three hundred and fifty pages having more than one hundred and fifty full page pictures. Strictly a symptomatic approach to treatment, the author claims nothing revolutionary in theory for orthopedic foot lesions, but simply a common sense consideration of the patients' needs for restoration or function and the most expedient means of accomplishing it. The chart diagnostic procedure and the charted disposition of a case is a unique feature of the book. An entire section has been devoted to a graphic presentation of manipulation, with Dr. Lester A. Walsh demonstrating technique.

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ORGANIZATION NEWS

MISSISSIPPI

THE Mississippi State Board of Health held its annual examination and licenses were granted to Drs. Edward H. Mattingly and Donald J. Zichichi. Dr. Mattingly will locate in Columbus and Dr. Zichichi on the Gulf Coast.

PENNSYLVANIA

THE South Central Division of the Chiropody Society of Pennsylvania held a regular meeting in Harrisburg June 27, 1950. Dr. James Worrell lectured on "Circulatory Disorders and Their Relation to the Lower Extremities."

MARYLAND

THE annual meeting of the Maryland Pedic Association was held June 11, 1950, at the Lord Baltimore Hotel in Baltimore. The following officers were elected:
President—Dr. Jack Kleger
Vice President—Dr. Maurice Walsh
Secretary—Dr. Verdin Cantrell
Treasurer—Dr. William Lee
N.A.C. Delegate—Dr. Jack Kleger
N.A.C. Alternate—Dr. Louis Datz
N.A.C. Council Member—Dr. Althea Miller
Executive Committee Member—Dr. C. A. Stein

VIRGINIA

GOVERNOR BATTLE of Virginia recently announced the appointment of Dr. Albert Pincus of Richmond as a member of the Virginia State Board of Medical Examiners. This is the first appointment of its kind. Dr. Kenneth Graves of Roanoke was reappointed Secretary and all inquiries relative to medicine or

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  Supplies
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  Instruments
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Information and price list upon request

chiropody should be directed to Dr. Graves, whose address is 631 1st Street, S.W., Roanoke, Va.

RHODE ISLAND

THE regular meeting of the Rhode Island Chiropodists Society was held June 21, 1950 at Lindsey's on Smithfield. The delegate to the N.A.C. convention in Boston was instructed to oppose participation in zone conventions. A certificate of merit was presented to Dr. A. L. Hubby for his efforts in behalf of the society. Dr. P. H. Davis received a plaque for his services as President in 1920-21.

FLORIDA

THE Podiatry Association of Florida has officially changed its name to the Chiropody Association of Florida.

MID-ATLANTIC STATES MEET

REPRESENTATIVES of the affiliated societies in Virginia, District of Columbia, North Carolina and West Virginia recently met to form the Mid-Atlantic Association of Chiropodists comprising Region Eight of the N.A.C.. The following officers of this regional group were elected:

Chairman—Dr. R. G. Abernathy
Vice Chairman—Dr. Seward P. Nyman
Secretary-Treasurer — Dr. Stanley Fedder
Public Relations—Dr. Julian N. Levin

Plans are being made for a Scientific Symposium to be held in September or October.

CANADIAN ASSOCIATION HOLDS ANNUAL CONVENTION

THE Canadian Association of Chiropodists will hold its Silver Jubilee Convention at the Mount Royal Hotel in Montreal September 3-6, 1950.

Dr. Raymond K. Locke of Englewood, N. J., will lecture on the following subjects: "Principles of Roentgenological Interpretation," "Patient-Doctor Psychology," "Contractures of the Leg and Thigh Muscles, Their Effect on Foot Imbalance and Treat" and "Correlation of Diagnostic Techniques and Treatment."

Other lecturers are M. S. Straker, M.D., C.M., whose subject will be "Psychiatric and Neurological Problems Relative to Practice of Chiropody"; Lyon Lapin, M.D., C.M., on "Differential Diagnosis in Peripheral Vascular Diseases"; and B. P. Heller, M.D., C.M., will conduct a forum on "Dermatology."

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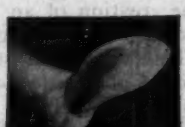
Sturdy quality latex—Delicate flesh pink. Easy to stretch on. Fit either foot. Made for long, satisfactory service.



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Business sessions are scheduled to be held on September 5th and 6th. The Co-Chairmen of the Convention Committee are Drs. J. W. Kaufman and Claude Laliberte.

TEMPLE UNIVERSITY GRADUATES FIFTY-SEVEN

THE Sixty-fourth Annual Commencement exercises of Temple University were held on June 15, 1950, at the Municipal Convention Hall in Philadelphia. The commencement address was delivered by Dr. William Goodwin Avirett.

Fifty-seven graduates of the School of Chiropody were presented for degrees by Dr. C. Gordon Rowe, who served in place of Dean Krausz. Seventeen prizes were awarded to various members of the class of 1950.

Fourteen members of the class have been granted one-year internships in the school's clinics according to an announcement by Dr. Frank Bossle, Comptroller of Clinics. The new interns will be required to complete 480 hours of clinical work at the school, Philadelphia General Hospital, University of Pennsylvania Hospital, or other affiliated metabolic clinics prior to June, 1951.

More than 6,600 adults and 625 children were treated at Temple's School of Chiropody clinics from September, 1949, to May, 1950.

ILLINOIS COLLEGE CREATES ADMINISTRATIVE COUNCIL

THE Illinois College of Chiropody and Foot Surgery has announced the creation of an Administrative Council comprising 11 members. This group will supplement the Board of Trustees and school administrative officers in formulating school policies, budgets, organization and general problems.

Following have been appointed to serve on the Council:

Donald V. Anderson, B.A., D.S.C., Dean

Ray M. Dix, D.D.S., Professor of Operative Dentistry, Northwestern University Dental School.

Russell Dudman, B.S., D.S.C., Professor and Head, Department of Chemistry

Douglas T. Mowbray, D.S.C., F.A.C.F.S., Chiropodist

Ernst Nora, M.D., Life Fellow American Society Clinical Pathologists, President of Staffs, Columbus and Cuneo Hospitals

Leroy C. Numbers, B.S., D.S.C., Registrar

A. V. Partipilo, M.D., F.A.C.S., Associate Professor of Surgery, Loyola University Medical School

Abe Rubin, D.S.C., Chief Clinician, The Foot Clinics of Chicago

Harold E. Wheeler, D.S.C., (Hon.) F.A.A.C., Chairman President, Board of Trustees

Donovan Yost, D.S.C., Chiropodist

One vacancy on the Council remains to be filled.

MISCELLANEOUS

THE NATURE OF BIOPHYSICS AND THE RESPONSIBILITIES OF A DEPARTMENT OF BIOPHYSICS

RESEARCH in the biological and medical sciences grows increasingly dependent on physical and physicochemical tools, many of them of great technical complexity. The public, as well as biological scientists, became increasingly aware of the usefulness of electronic amplifiers, of photoelectric devices, of electron microscopes, of radioactive tracers and so on in medical research, as well as those electrical

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Descriptive data and prices upon application.
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For Treating
FUNGOUS INFECTIONS OF THE NAILS

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A solution of high purity and exceptionally close tolerances, packed in 2cc ampoules.

Ammoniacal Silver Nitrate is an active fungicide with advantages of penetrating nail tissue to the nail bed.

Information has appeared in medical and chiropody journals.

Makers of Ammoniacal Silver Nitrate for therapeutic uses for more than thirty years.

and mechanical aids in diagnosis and therapy that have long been in use. Biophysics has a great tradition, established by such men as Galvani, Poisseille, Helmholtz, Faraday, Young, Otto Franck and a host of others as eminent in physics as in the biological sciences. Nor has the tradition been broken, when there are modern leaders such as Professor A. V. Hill. The early leaders did not, of course, call themselves "biophysicists" for the division and subdivisions of science that have occurred were still largely unknown.

The establishment of departments of biophysics should be initiated only where simultaneously there is a closer integration between the courses in physiology and biochemistry. In one school, as in a few others, the unity of "physiology" as a whole has been recognized by formally combining the courses of physiology and biochemistry into one interlocking two-year course of "physiology and biochemistry." It is possible that one day the course may be called "biochemistry, biophysics and integrative physiology." With this view of the nature of biophysics, it becomes an easier task to define the functions of a department of biophysics in a medical school. As for every other department, these can be divided into duties concerned with teaching and with research, though of course each of these should be undertaken by all members of the department since the practice of each (teaching and research) so greatly improves the performance of the other.

It seems inevitable, as there is reviewed the rise of biochemistry to its present status in the medical school that biophysics will follow a similar evolutionary course. The new addition (not really new at all) to the family of physiology has

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For practicing chiropodists who are members of the N.A.C.

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McIntosh Electrical Corp.
71st Anniversary Feb. 4, 1950
231 North California Avenue
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THE TRENCHANT QUESTION:

What make of low volt equipment is used by Leading Chiropodists?

The McIntosh Sinustat will help augment your clientele just as it has helped others for many years.

No. 1532 Plastic Tank includes:
2 Bifurcated cords required for ionization.
2 Lead electrodes illustrated in tank for either ionization or sine wave treatment.
2 Copper electrodes for use with Copper Sulphate Solution.
1 Lb. Copper Sulphate, U.S.P. XIII.
1 Lb. Magnesium Sulphate, U.S.P. XIII.

Price, Plastic Tank $25.00
(Suitable for use with any low volt machine)

Gentlemen
Send No. 1532
Plastic Tank
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$25.00 enclosed.
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J.N.A.C.

been welcomed and given a name, but there is a graver danger that the child will be raised a technician rather than an independent investigator, will be sent to a polytechnic institute rather than to a university, and though occupying a useful place in the community of scientists, will fall short of the exalted station in life occupied by his illustrious biophysical forbears. Biological science will be the loser if this danger is not realized and avoided.

Allan G. Burton—J.A. Am. Med. Coll. July 1949.

THERAPEUTIC CRITERIA IN RHEUMATOID ARTHRITIS

THE first consideration in undertaking the treatment of a patient with rheumatoid arthritis is to determine: the stage of the disease, the presence of rheumatoid activity and the degree (class) of functional impairment. A patient therefore would be classified as having rheumatoid arthritis, active or inactive, stage, class. With treatment the stage of the disease rarely improves. However, either rheumatoid activity or functional impairment, or both, may respond. For the purpose of clinical evaluation of response to treatment, therefore, there are two variables—rheumatoid activity and functional impairment. It is the opinion of committee that rheumatoid activity represents the crucial basis for assessment of the effectiveness of any therapeutic agent. For the purpose of evaluation of the response of rheumatoid activity to any treatment, the signs of active disease presented by the patient at the initial examination constitute the maximum evidence of rheumatoid activity in that person, and form the basis for determination of response to therapy by decrease in those signs of activity. For example, a patient at the beginning of treatment may be a stage III, active, class IV, and can, after a suitable period of therapy still be in stage III, yet may show grade II improvement of rheumatoid activity and class II functional capacity. The classification of functional impairment together with the criteria for therapeutic response of rheumatoid activity can give a helpful insight into the usefulness of the whole treatment program, which may include such general procedures as physical therapy, rehabilitation measures, psychotherapy, orthopedic corrections, analgesic and constitutional therapy and many others. For the purpose of evaluating specific therapeutic agents, this committee recommends that reports of such treatment should be based only on the "Criteria for Therapeutic Response of Rheumatoid Activity."

Cornelius H. Traeger and Robert C. Batterman—J.A.M.A. June 25, 1949.

ARMY TESTS ANTI-HISTAMINE FOR FUNGUS INFECTIONS

CAPTAIN LAYNE E. CARSON of the Army Medical School in Washington conducted tests with the chemical compound diphenylpyraline on

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The application is simple, painless and convenient.

SCHRAM'S SALISACOM Comp. REG. U.S. PAT. OFF.

Active ingredients:
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in an emollient base

Complete directions with each jar.

SALISACOM is supplied in
1 oz. jar $1.00 — 8 oz. jar $6.00
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cases of fungus infections of the feet. Preparation used was in the form of an ointment. The report indicates that following the application of the medicament, itching, swelling and inflammation quickly subside.

Preliminary experiments were conducted by Miss Charlotte Campbell, mycologist at the Army Medical School. Large scale test has now been set up among troops stationed in Puerto Rico. More than 100 patients were treated at the Walter Reed Hospital with excellent results.

ANTIFUNGAL AGENT

FRADICIN, an antibiotic, which is active only against fungi, is produced by *Streptomyces fradiae,* the same organism that produces neomycis. Dr. E. Augustus Swart and associates of Rutgers University, New Brunswick, N. J. find that fradicin is best produced in media containing glucose. The agent remains stable for thirty minutes at temperatures up to 100° at pH 7. Chloroform, methanol ethanol, butanol, and amylalcohols are solvents for the antibiotic.

Proc. Soc. Exper. Biol. & Med. 73: 376-378, 1950.

TIBIAL TORSION

THE normal adult tibia exhibits about 20 degrees of external torsion. Extremes of tibial torsion, internal or external, if permitted to persist, produce handicapped members of adult society. Infants and preschool-age children have less external rotation than adults. Normal developmental changes do not correct extremes of torsion to any great extent, especially in school-age children. Positions and other attitudes of posture will pro-

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duce rotational changes in the tibia, depending upon the direction of the rotary stress applied. Correction of these deformities is possible in the growth period by the application of a simple night splint, which produces a rotational stress in a direction opposite to that of the deformity. Deformities which are present at three years of age or older should be corrected at that age; younger children with torsional deformity should be observed in order to determine what compensatory changes may occur. *Charles G. Hutter, Jr., and Walter Scott—J. Bone & Surg. July, 1949.*

COMMUNICATION

To the Editor:

The June issue of the Journal contained the advertisement of a laboratory, which in connection with the "Levy Mould," stated: "Permission to use the name Levy Mould has been granted to us by Dr. Benjamin Levy of Schenectady, N .Y."

I am certain that the laboratory did not intend to create the impression that there was any financial consideration connected with this permission, but unfortunately, two inquiries within the past 48 hours, convinces me that the notion exists.

There are no restrictions placed on the fabrication of the appliance, and I trust the publication of this letter will eliminate further misunderstanding.

Ben Levy, Pod.D.
821½ State Street
Schenectady, N. Y.

BUNIONS

1. Let fall a stream of very warm water from a teakettle, at the highest elevation from which the patient can bear the water to fall directly on the apex of the swelling; continue this once a day for a short time and a cure will be ef-

fected, providing you desist from wearing short shoes. The greater the elevation of the kettle, the more effectual the remedy.

2. It is said that the following is a good remedy: use pulverized saltpetre and sweet oil; obtain at the druggist 5 or 6 cents worth of saltpetre, put into a bottle with sufficient olive oil to nearly dissolve it; shake up well and rub the inflamed joints night and morning, and more frequently if painful. This is a well-tried remedy.

3. When the bunion is painful, put 3 or 4 leeches on the joint of the toe, and do not disturb them until they drop off; then bathe the bunions twice a day in fresh cream, and afterwards renounce tight boots. Of course, this remedy will not remove the swelling of the bone.

The Home Physician 1868.

BLISTERED FEET

When the hands are blistered from rowing, or the feet from walking or other causes, be careful not to allow the blisters to break, if possible. Some persons are in the habit, by means of a needle and a piece of worsted, of placing a seton into the blisters to draw off the water; but in our opinion this is a great mistake and retards the healing. Bathe the blisters frequently in warm water, or if they are very severe, make a salve of tallow, dropped from a lighted candle into a little gin and worked up to a proper consistency, and on going to bed cover the blisters with this salve, and place a piece of plain soft rag over them.

The Home Physician 1868.

AMBULATORY TREATMENT OF PHLEBITIS

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*Schwartz, L., et al; Industrial Medicine, 18:6, 257-258, June, 1949.

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therapy and prophylaxis for phlebitis and deep thromboembolism. The compression bandage must be applied with the patient in bed. The bandage stimulates the venous circulation and prevents stasis in the lower extremities, particularly in the leg, where 90 per cent of all thromboemboli have their origin. Severe deep phlebitis may be prevented by this treatment when used prophylactically. Thirty-seven to 70 per cent of all patients with phlebitis will be affected at a later date by indolent ulcers of the leg, and the remaining patients will present other sequelae of phlebitis, such as edema of the leg, eczema, varices, varicophlebitis and spasms. Ninety-five per cent of all these patients may, therefore, be considered as partial invalids. The prophylactic effect of the compression bandage is particularly important because prophylactic treatment with anticoagulants cannot be practiced in the majority of the cases. Compression bandages may be applied after the occurrence of thromboembolism (phlegmasia alba dolens). Recovery time may be shortened considerably by combined treatment with anticoagulants and compression bandage.
Schweizerische, medizinische Wochenschrift, Basel, Jan. 14, 1950.

HARD FLOORS AND FATIGUE

To THE EDITOR:

I HAVE been asked to settle an argument between the safety inspector and the fire chief of this installation. One says that resilient floors have decreased industrial disabilities attributable to fatigue; the other thinks that rubber heels would be equally useful. Is there proof that hard floors are harmful if rubber heels are worn at all times by workers involved?

M.D., Oregon

ANSWER.—Standing motionless on a hard floor introduces no variable over resilient surfaces, but walking or running is different. Such acts impart to the body a coarse, irregular and infrequent vibration constituting a physiologic insult. Damage from such vibrating tools as pneumatic drills or jack-hammers is well established and chiefly is represented by synovitis, neuritis, local vascular instability and pathologic fatigue. The results from walking on hard floors are less well defined but are related. The muscles are held in a state of protective contraction; articular surfaces are rammed against one another; rarely, soft tissues about the ankles swell. Fatigue is in evidence. However, some degree of inurement arises, for which there is inadequate explanation. It is the newcomer to hard floors, who suffers the greatest discomfort. The infantryman subjected to long marches on hard pavement prefers his heavy marching shoes, but the hospital nurse continually walking on terrazzo floors elects shoes with rubber heels and sometimes rubber soles. In general, rubber heels and soles mitigate the body's impact on hard surfaces. With possible rare exception, floor resiliency and devices for shock absorption such as rubber heels and carpets promote bodily comfort.
J.A.M.A.

CONVENTION DATES

(CE—Commercial exhibitors invited)

CANADIAN ASSOCIATION OF CHIROPODISTS
Montreal, P. Q., Sept. 3-6, 1950
Mount Royal Hotel (CE)

MISSOURI ASSOCIATION OF CHIROPODISTS
St. Louis, Mo., Oct. 14-16, 1950
Jefferson Hotel

PEDIC RESEARCH SOCIETY
Chicago, Ill., Oct. 28-30, 1950
Sherman Hotel

AMERICAN ACADEMY OF CHIROPODISTS
Columbus, Ohio, Feb. 17-19, 1951
Neil House

REGION SIX CONVENTION
Des Moines, Iowa, Mar. 30, Apr. 1, 1950 (CE)

REGION THREE CONCLAVE
Atlantic City, May 11-13, 1951
Ambassador Hotel (CE)

DEATHS REPORTED

Dr. John P. Schmidt, Monroe, Wis.

Dr. Frank W. McCarthy, Dedham, Mass.

Dr. Allen J. Enty, Bradford, Pa.

Dr. W. M. Rademacher, Tulsa, Okla.

STATE AND LOCAL FOOT HEALTH WEEK CHAIRMEN REQUESTED TO REPORT

ALL state and local Foot Health Week Chairmen are requested to mail their reports on their respective F.H.W. programs for 1950 to the Executive Secretary immediately. Be sure to include clippings showing name of publications and mention name of radio stations, date and time on the air, and a brief description of all other activities sponsored in connection with F.H.W.

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